

Claims

1. A shell-type needle roller bearing comprising: a shell with both axial end portions of a cylinder portion bent radially inwards to form a pair of inward flange portions; and a plurality of needles which are provided so as to roll freely on a radial inside portion of the cylinder portion between inside surfaces of both inward flange portions, without being retained by a cage, in a state where they are directly adjacent and facing or in contact with the rolling surfaces of circumferentially adjacent needles, wherein

the inside surfaces of both inward flange portions make up inclined surfaces which are inclined in a direction where a distance between the surfaces becomes narrower towards the radial outward direction,

of both axial end surfaces of the needles, a portion nearer the center than a beveled portion on an outer peripheral portion, is shaped such that it does not project axially outwards more than an inner peripheral edge of the beveled portion, and

in a state where the needles are displaced in the axial direction, contact portions between both axial end surfaces of the needles and the inside surfaces of the inward flange portions are positioned at portions close to the radial outside of the inward flange portions.

2. A shell-type needle roller bearing according to claim 1, wherein an angle of the inside surfaces of both inward flange portions with respect to a virtual plane which exists in a direction orthogonal to a central axis of the shell, is 3 to 20 degrees, and at both axial end surfaces of the needles, a portion nearer the center than the beveled portion is a flat surface.
3. A shell-type needle roller bearing according to either one of claim 1 and claim 2, wherein in relation to the radial direction of the shell, a distance between an inner peripheral edge of both inward flange portions and an inner peripheral surface of the cylinder portion, is made smaller than a diameter of the cross section of the needles, and larger than $1/3$ of the diameter.
4. A shell-type needle roller bearing according to any one of claim 1 through claim 3, wherein the needles are affixed to an inner peripheral surface of the shell using grease.